REMARKS

Claims 1 - 24 and 28 - 34 are in this application and are presented for consideration. Claims 1 - 24, 28, 29, 32 and 33 have been amended, claims 25 - 27 have been canceled, claims 3 - 10, 12, 19 and 22 are withdrawn, and new claim 34 has been added.

Claim 28 has been rejected as being anticipated by Mabuchi. Applicant has amended claim 28 to add an additional feature of a rotation device. In the preferred embodiments of the present invention, this rotation device is the sensor device 10. Applicant has amended Fig. 6 to show the rotation device 10. Applicant also notes that the rotation or sensor device 10 is also shown in Figs. 7, 8 and 9.

Applicant thanks the Examiner for pointing out that a sensor or a torque device is not shown in the elected embodiment of Fig. 6. Applicant has amended Fig. 6 with this Amendment to show the rotation device 10. This rotation device 10 in Fig. 6 represents either a sensor or a torque device. Fig. 6 was originally shown to show the cross-section of the gear train of the present invention. Fig. 6 concentrated on a particular internal arrangement of the gears in the present invention. Original Fig. 6 did not specify external devices connected to the gear train, and instead was originally generic to cover all possible external devices.

In order to further define over Mabuchi, Applicant has added the feature of the rotation device to Fig. 6, and to claim 28. Since original Fig. 6 was generic to external devices, the change to Fig. 6 is in accordance with the Patent Office regulation that all features present in the claims are to be shown in the drawings. New claim 28 is therefore now properly represented by Fig. 6. If the Examiner has any comments or suggestions for alternate changes

to Fig. 6, or to the specification, the Examiner is invited to contact Applicant's representative by telephone to discuss possible changes.

Claim 28 has also been amended to further emphasize all of the different rotation connections that the gear train of the present invention can have. In particular claim 28 has been amended to set forth three different rotation connections. In the embodiment of Fig. 6, the first rotation connection is on the top between elements 7 and 4b. This is preferably an input rotation connection. The second rotation connection is preferably at the bottom outside portion of Fig. 6, and is between elements 3 and 4. This rotation connection is preferably an output rotation connection. The third rotation connection is in the bottom center of Fig. 6 and is between shaft 15 and element 3b. In amended Fig. 6, Applicant has added the rotation device 10 to this third rotation connection. This third rotation connection can either be an output connection when a sensor is connected to shaft 15 and element 3b, or it can be an input rotation connection when a motor is connected to shaft 15 and element 3b.

As the Examiner can appreciate, movement or rotation in a gear train is relative. In the embodiment of Fig. 6, gear part 4 could be fixed or stationary, and gear part 3 could be allowed to turn and power the parts of the robot. Likewise, gear part 3 could be held fixed or stationary, and gear part 4 could rotate to power the parts of the robot. Furthermore, gear part 3 could be rotated by a motor while gear part 4 is held fixed. This would then cause shaft 7 to rotate, and shaft 7 could then be used to power parts of the robot. An important feature of the present invention is that a gear train is provided with three different rotational connections, and that a compact relationship is provided between the first and second gear parts, and the

reference shaft as set forth in claim 28.

Applicant has reviewed Mabuchi, and finds that Mabuchi describes a rotating unit where rotational input power is supplied by motor 1. Element 4 appears to be held stationary, and element 8/9 appears to rotate. It appears that the motor 1 and gear 2 of Mabuchi are equated with the first rotation connection of claim 28. The rotating wheel 8 of Mabuchi appears to be equated with the second rotation connection of the present invention. Element 5 of Mabuchi appears to be equated with the third rotation connection of claim 28. Applicant has reviewed Mabuchi, and does not find any teaching nor suggestion that element 5 of Mabuchi would be a rotation connection. Mabuchi just appears to place a cap over element 5. Applicant finds no teaching nor suggestion in Mabuchi that the area around element 5 is to be a rotation connection. Further, Applicant finds no indication that the cap on element 5 is a rotation device. It is only Applicant who has discovered that a third rotation connection can be provided on the end of a reference shaft which passes through a second gear part. A person of ordinary skill in the art would have no incentive to make element 5 of Mabuchi a third rotation connection. Therefore it is Applicant's position that Mabuchi does not teach nor suggest a third rotation connection.

Even if element 5 of Mabuchi is considered to be a rotation connection, Mabuchi does not teach nor suggest providing a rotation device on element 5 of Mabuchi. It is only the present invention which actually provides a device for using a rotation connection between a reference shaft and a second gear part. Since Mabuchi does not teach nor suggest any rotational device which uses a third rotation connection in a gear train, claim 28 therefore

further defines over Mabuchi.

New claim 34 sets forth that the rotation device one of removes rotation from the gear train, or applies rotation to the gear train. In the preferred embodiments of the present invention, the rotation device can be a sensor which measures the difference in rotation between the reference shaft 15 and the second gear part 3. The sensor is considered a device which then removes rotation from the gear train. In another embodiment of the present invention, it is possible to apply rotation relative to the reference shaft 15 and the second gear part 3. This is described in the present specification on page 3 fourth full paragraph. In such a situation, the rotation device is a motor which applies auxiliary torque or power when needed.

Applicant has reviewed Mabuchi, and finds no teaching nor suggestion that element 5, or the cap on element 5, removes rotation from the gear train, or applies rotation to the gear train. Therefore claim 34 further defines over Mabuchi.

It is an important feature of the present invention that three rotation connections be provided, and that the different parts be positioned as set forth in claim 28. This provides for a very compact gear train, but still a gear train that has three different rotation connections. If the Examiner has any comments or suggestions for alternately describing these connections and the relationships, the Examiner is invited to contact Applicant's representative by telephone to discuss possible changes.

Attached to this Amendment, Applicant has included a version of claim 28 with reference numbers. These reference numbers have been provided to make it easier to understand the claims, in light of the drawings. However these reference numbers are not to

be considered to further limit the claim in any way, or to indicate that the features of claim 28 are restricted by the corresponding elements shown in the drawings. The numbers have only been provided to allow the Examiner to more readily compare the claims to the drawings.

Claim 1 has been amended to set forth that the axis of the reference shaft is radially spaced from an axis of the drive shaft. In the embodiment of Fig. 6, the drive shaft is represented by reference 7, and the reference shaft by reference number 15. As one can see, the axis of these two shafts are radially spaced from each other. In the rejection of claim 1, element 2 of Mabuchi is equated with the drive shaft of claim 1, and it appears that element 5 of Mabuchi is equated with the reference shaft of claim 1. Applicant has reviewed Mabuchi, especially Figs. 1 and 3, and finds that elements 2 and 5 of Mabuchi appear to be coaxial. Therefore elements 2 and 5 do not show a reference shaft radially spaced from an axis of a drive shaft. Claim 1 therefore defines over Mabuchi.

Claim 1 has also been amended to set forth a bearing rotatably connecting the first and second parts. In the embodiment of Fig. 6, reference 5 is one embodiment of such a bearing. Applicant has reviewed Mabuchi, and finds no teaching nor suggestion of a bearing connecting first and second parts. Therefore it is Applicant's position that claim 1 therefore further defines over Mabuchi.

If the Examiner has any comments or suggestions which would further favorable prosecution of this application, the Examiner is invited to contact Applicant's representative by telephone to discuss possible changes.

At this time Applicant respectfully requests reconsideration of this application, based on the above amendments and remarks, respectfully solicits allowance of this application.

Respectfully submitted
for Applicant,

By: _____

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Enclosed: Version of Claim 28 with reference numbers
Replacement Sheet - Fig. 6
Marked-Up Version of Fig. 6 using claim language
Petition for One Month Extension of Time

DATED: May 20, 2004
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SHOULD ANY OTHER FEE BE REQUIRED, THE PATENT AND TRADEMARK OFFICE IS HEREBY REQUESTED TO CHARGE SUCH FEE TO OUR DEPOSIT ACCOUNT 13-0410.

28. (Currently Amended) A gear arrangement for driving an external device, the arrangement comprising:

a first gear part (4) having a first side (4b) and a second side;

a second gear part (3) rotatably connected to said first gear part to form a gear train, said second gear part (3) having a first side adjacent said second side of said first gear part (4), said second gear part (3) having a second side (3b) positioned diametrically opposite said first gear part (4), said first side (4b) of said first gear (4) being positioned diametrically opposite said second gear part (3);

a first rotation connection (6/7) ~~drive input~~ rotatably connected to said first gear part (4) on a side of said first gear part (4) other than said second side of said first gear part (4), said first rotation connection (6/7) forming a part of said gear train;

a second rotation connection connected to one of said first and second gear parts (4/3), said second rotation connection also forming part of said gear train; ~~and~~

a third rotation connection between said first and second gear parts (4/3), said third rotation connection also forming part of said gear train, said third rotation connection including a reference shaft (15) rotationally fixed to one of said first gear part (4) and said second gear part (3), said reference shaft (15) ~~at least~~ extending ~~into~~ through the other of said second gear part (3) and said first gear part (4);

a rotation device (10) connected to said third rotation connection.